process, said process comprising the steps of:

flowing into a plasma reaction chamber a gas mixture comprising a first amount of hexafluorobutadiene and a second amount of a chemically inactive diluent gas and including substantially no carbon monoxide, wherein a ratio of said second amount to said first amount is at least one;

applying a first level of RF power to a pedestal electrode supporting a substrate containing said oxide and nitride layers; and

exciting said gas mixture into a plasma to thereby selectively etch said oxide layer to said nitride layer.

2. (Already Amended) The process of Claim 1, wherein said oxide layer overlies said nitride layer and said ratio is at least ten, to thereby etch said oxide layer selectively to said nitride layer.

12. The process of Claim 1, wherein said exciting step includes applying an oscillatory electrical signal to excite said gas mixture into a plasma in a region remote from said pedestal electrode.

13. The process of Claim 12, wherein said oscillatory electrical signal is coupled to an inductive coil adjacent to said chamber.

14. (Already Amended) The process of Claim 12, wherein said applying steps applies at least 1600W to said pedestal electrode normalized to a 200mm wafer.

16. The process of Claim 1, wherein processing conditions are chosen to produce a processing window of 25% in the amount of the fluorine-containing gas.

21. (Twice Amended) A process for etching an oxide layer preformed with first holes extending downwardly from a top surface thereof, comprising the steps of:

flowing into a plasma reaction chamber a gas mixture comprising a first amount of a fluorine-containing gas and a second amount of a chemically inactive diluent gas, wherein a ratio of said second amount to said first amount is at least one;

applying a first level of RF power to a pedestal electrode supporting a substrate containing said oxide ~~and non-oxide~~ layer; and

exciting said gas mixture into a plasma to etch said oxide layer, wherein corners of said oxide layer at tops of said first holes are exposed during the process.

22. The process of Claim 21 carried out in the presence of a nitride layer, wherein said plasma etches said oxide layer selectively to said nitride layer.

23. The process of Claim 22, wherein said oxide layer overlies said nitride layer.

24. The process of Claim 21, wherein said fluorine-containing gas comprises a fluorocarbon.

25. The process of Claim 24, wherein said fluorocarbon consists of at least four carbon atoms, at least an equal number of fluorine atoms, and no more than two hydrogen atoms.

26. The process of Claim 24, wherein said fluorocarbon is hydrogen free.

27. (Twice Amended) The process of Claim ~~23~~ 13, wherein said fluorocarbon is selected from the group consisting of C_4F_6, C_5F_8, and C_6F_6.

28. The process of Claim 27, wherein said fluorocarbon comprises hexafluorobutadiene.

29. The process of Claim 28, wherein said oxide layer overlies a nitride layer and said plasma etches said oxide layer selectively to said nitride layer.

30. The process of Claim 1, wherein said chemically inactive diluent gas is xenon.

31. The process of Claim 1, wherein said chemically inactive diluent gas is argon.

32. The process of Claim 21, wherein said chemically inactive diluent gas is xenon.

33. The process of Claim 21, wherein said chemically inactive diluent gas is argon.

34. (New) The process of Claim 21, wherein said fluorocarbon comprises C_5F_8.

35. (New) The process of Claim 21, wherein said oxide layer is precoated with an etching mask having an aperture larger than and surrounding at least one of said first holes.

36. (New) The process of Claim 21,

wherein said exciting step etches second holes in said oxide layer, and

wherein said first holes form via holes and said second holes form trenches in a dual damascene interconnect system.

37. (New) A dual damascene process for etching an oxide layer preformed with first holes extending downwardly from a top surface thereof and covered by a mask layer including a second hole therethrough larger than and surrounding at least one of said first holes, comprising the steps of:

flowing into a plasma reaction chamber a gas mixture comprising (a) a fluorocarbon selected from the group consisting of C_4F_6, C_5F_8, and C_6F_6 and (b) a chemically inactive diluent

gas; and

applying RF power to a pedestal electrode supporting a substrate containing said oxide layer and exciting said gas mixture into a plasma to etch said oxide layer, wherein corners of said oxide layer at tops of said first holes are exposed during the process.

24 ~~38~~. (New) The process of Claim 23 ~~37~~, wherein a portion of a top surface of said oxide layer is exposed by said second hole.

25 ~~39~~. (New) The process of Claim 23 ~~37~~, wherein a nitride layer is disposed below said oxide layer and is exposed by said first holes.

D2

26 ~~40~~. (New) The process of Claim 25 ~~39~~, wherein no other nitride layer is disposed between a top surface of said oxide layer and said nitride layer.

27 ~~41~~. (New) The process of Claim 23 ~~37~~, wherein said fluorocarbon comprises hexafluorobutadiene.

28 ~~42~~. (New) The process of Claim 23 ~~37~~, wherein said fluorocarbon comprises C_5F_8.

29 ~~43~~. (New) The process of Claim 23 ~~37~~, wherein a separate source of oscillatory electrical power excites said gas mixture to said plasma.

30 ~~44~~. (New) The process of Claim 23 ~~37~~, wherein said RF power applied to said pedestal electrode excites said gas mixture to said plasma, no other effective source of oscillatory electrical power being applied to said plasma reaction chamber.

31 ~~45~~. (New) The process of Claim 23 ~~37~~, wherein said applying and exciting step is

D2 terminated before portions of said oxide layer exposed by said second hole are etched through.